

What is claimed is:

1. A system for manipulating magnetizable particles having nucleic acid molecules bound thereto and being in a solution contained in at least one tube, said system comprising:

5 a tube receiver having at least one tube opening adapted to receive said tube therein;

at least one first magnet;

10 a magnet moving device, adapted to selectively move said first magnet between a first location with respect to said tube to attract said magnetizable particles toward an inner wall of said tube, and a second location with respect to said tube to allow said magnetizable particles to be suspended in said solution; and

15 a second magnet, adapted to apply a magnetic field to said magnetizable particles when said first magnet is positioned at said second location, to remove a magnetization imposed on said magnetizable particles by said first magnet.

20 2. A system as claimed in claim 1, wherein:

25 said second magnet comprises an AC electromagnet, and said magnetic field comprises an AC magnetic field.

3. A system as claimed in claim 1, wherein:

30 said second magnet is substantially stationary with respect to said tube.

4. A system as claimed in claim 1, wherein:

35 said first and second magnets are disposed on substantially opposite sides of said tube.

5. A system as claimed in claim 1, wherein said magnet moving device comprises:

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a cam and cam driver, said cam driver being adapted to drive said cam to move said first magnet between said first and second locations.

6. A system as claimed in claim 1, wherein said magnet moving device
5 comprises:

at least one first panel having a first opening therein;

at least one second panel having at least one second opening therein, extending transverse to said first opening; and

10 an extension which is coupled to said first magnet and passes through said first and second opening;

said second panel being adapted to move with respect to said first panel to apply a driving force to said extension to cause said extension to move along said first and second openings between said first and second locations.

15 7. A system as claimed in claim 6, further comprising:

a motor, adapted to drive said second panel to move with respect to said first panel.

8. A system as claimed in claim 1, wherein:

20 said tube receiver has a plurality of said tube openings for receiving a plurality of said tubes therein;

said system comprises a plurality of said first magnets, each being positioned with respect to at least one of said tube openings; and

25 said magnet moving device is adapted to move said plurality of said first magnets between respective said first and second locations.

9. A system as claimed in claim 8, further comprising:

a plurality of second magnets, each being adapted to apply a magnetic field to said magnetizable particles in at least one of said tubes when a respective one of said

first magnets is positioned at a respective said second location to substantially remove a magnetization imposed on said magnetizable particles by said respective first magnet.

10. A system as claimed in claim 1, further comprising:

5 a thermal element, adapted to at least one of apply thermal energy to said solution in said tube and extract thermal energy from said solution in said tube.

11. A system as claimed in claim 1, wherein:

10 said magnet moving device is adapted to move said magnet between said first and second locations in a first direction which is substantially parallel to a longitudinal axis of said tube.

15 12. A method for manipulating magnetizable particles having nucleic acid molecules bound thereto and being in a solution contained in at least one tube, said method comprising:

20 receiving said tube in a tube receiving opening of a tube receiver;
selectively moving a first magnet to a first location with respect to said tube to attract said magnetizable particles toward an inner wall of said tube, and to a second location with respect to said tube to allow said magnetizable particles to be suspended in said solution; and

25 applying a magnetic field to said magnetizable particles when said first magnet is positioned at said second location, to substantially remove a magnetization imposed on said magnetizable particles by said first magnet.

13. A method as claimed in claim 12, wherein:

said magnetic field comprises an AC magnetic field.

14. A method as claimed in claim 12, wherein:

said first magnet is coupled to a cam; and

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said selectively moving step comprises the step of driving said cam to move said first magnet between said first and second locations.

15. A method as claimed in claim 12, wherein:

5 said tube receiver has a plurality of said tube openings for receiving a plurality
of said tubes therein; and

said moving step comprises the step of moving a plurality of said first magnets between respective said first and second locations with respect to respective said tubes.

16. A method as claimed in claim 15, wherein:

said applying step applies a respective magnetic field to said magnetizable particles in each of said tubes when a respective one of said first magnets is positioned at a respective said second location to substantially remove a magnetization imposed on said magnetizable particles by said respective first magnet.

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17. A method as claimed in claim 12, further comprising:

at least one of applying thermal energy to said solution in said tube and extracting thermal energy from said solution in said tube.

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18. A method as claimed in claim 12, wherein:

said magnet moving step moves said magnet between said first and second locations in a first direction which is substantially parallel to a longitudinal axis of said tube.

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19 A method as claimed in claim 12, wherein:

said applying step applies said magnetic field to said magnetizable particles from a side of said tube substantially opposite to a side adjacent to said first location.

20. A method as claimed in claim 12, wherein:

said magnet moving step maintains said magnet at said first location for a time sufficient for removal of said solution from said tube.

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